



Electromechanical Technology/Electromechanical Engineering Technology, Classification of Instructional Program (CIP) 15.0403

Units of Instruction and Task Grid Linked to Pennsylvania Core Standards

100 Demonstrate Knowledge of Technical Reports

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p>101 Identify components of technical reports.</p> <p>102 Demonstrate knowledge of the common components of technical documents.</p> <p>103 Maintain a daily journal or timecard.</p>	<p>CLUSTER: <i>Science, Technology, Engineering and Math</i> Choose Cluster Standards from: 1-2-3-4-5-6</p> <p>2 PATHWAYS: <i>Engineering and Technology Careers</i> Choose Standards from: 1-2-3-4-5-6</p>	<p>KEY IDEAS/DETAILS GRADES 9-10 Standard CC.3.5.9-10.A. Cite specific textual evidence, etc.... Standard CC.3.5.9-10B & Determine the central ideas or conclusions of a text; etc... Standard CC.3.5.9-10.C Follow precisely a complex multistep procedure, etc...</p> <p>KEY IDEAS/DETAILS GRADES 11-12 Standard CC.3.5.11-12A Cite specific textual evidence, etc.... Standard CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; etc... Standard CC.3.5.11-12.C. Follow precisely a complex multistep procedure, etc...</p> <p>CRAFT & STRUCTURE GRADES 9-10 Standard CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain specific words... Standard CC.3.5.9-10.E</p>	<p>TEXT TYPES AND PURPOSE GRADES 9-10 Standard CC.3.6.9-10.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>TEXT TYPES AND PURPOSE GRADES 11-12 Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10 Standard CC.3.6.9-10.C Produce clear and coherent writing...appropriate to task, purpose, and audience. Standard CC.3.6.9-10 D Develop and strengthen writing as needed. Standard CC.3.6.9-10.E Use technology, including the internet, to produce, publish, and update individual or shared writing</p>	

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
		<p>Analyze the structure of the relationships among concepts in a text. etc. Standard CC.3.5.9-10.F Analyze the author's purpose in providing an explanation, describing a procedure...</p> <p>CRAFT & STRUCTURE GRADES 11-12 Standard CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain specific words... Standard CC.3.5.11-12.E. Analyze the structure of the relationships among concepts in a text. Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...</p> <p>INTEGRATE KNOWLEDGE/ IDEAS GRADES 9-10 Standard CC.3.5.9-10.G. Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart). Standard CC.3.5.9-10.H. Assess the reasoning in a text to support the author's claim for solving a technical problem. Standard CC.3.5.9-10.I. Compare and contrast findings presented in a text to those from other sources, etc...</p> <p>INTEGRATE KNOWLEDGE/ IDEAS GRADES 11-12 Standard CC.3.5.11-12.G. Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem. Standard CC.3.5.11-12.H. Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible. Standard CC.3.5.11-12.I. Synthesize information from a range of sources into a coherent understanding.</p> <p>RANGE OF READING</p>	<p>products.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 11-12 Standard CC.3.6...11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience. Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D. Develop and strengthen writing as needed. Standard CC.3.6.11-12.E. Use technology, including the internet, to... share writing products.</p> <p>RESEARCH GRADES 9-10 Standard CC.3.6.9-10.F. Conduct short and more sustained research. Standard CC.3.6.9-10.G. Gather relevant information. Standard CC.3.6.9-10.H. Draw evidence from informational texts.</p> <p>RESEARCH GRADES 11-12 Standard CC.3.6.11-12.F. Conduct short and more sustained research. Standard CC.3.6.11-12.G. Gather relevant information. Standard CC.3.6.11-12.H. Draw evidence from informational texts for research.</p> <p>RANGE OF WRITING GRADES 9-10-11-12 Standard CC.3.5.9-10.I and Standard CC.3.5.11-12.I. Write over extended and shorter time frames for a range of tasks, purposes and audiences...etc.</p>	

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		<p>GRADES 9-10-11-12 Standard CC.3.5.9-10.J AND Standard CC.3.5.11-12.J. By the end of grades 9-10, AND 11-12, read and comprehend technical texts independently and proficiently.</p>		

200 Demonstrate Safety in the Laboratory

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p>201 Demonstrate knowledge of accident prevention.</p> <p>202 Identify safe work habits.</p> <p>203 Demonstrate safe and proper use of hand tools.</p> <p>204 Demonstrate safe and proper use of portable power tools.</p> <p>205 Demonstrate safe and proper use of the drill press.</p> <p>206 Describe the dangers of unruly behavior.</p> <p>207 Identify electric shock hazards.</p> <p>208 Identify fire dangers of electronic circuits.</p> <p>209 Use appropriate fire extinguishers for different classes of fires.</p> <p>210 Describe the importance of Safety Data Sheets (SDS) information.</p> <p>211 Describe and understand arc flash protection and National Fire Protection Act 70E.</p> <p>212 Describe and demonstrate the lock out/tag out procedure.</p>	<p>CLUSTER: <i>Science, Technology, Engineering and Math</i></p> <p>Choose Cluster Standards from: 1-2-3-4-5-6</p> <p>2 PATHWAYS: <i>Engineering and Technology Careers</i></p> <p>Choose Standards from: 1-2-3-4-5-6</p>	<p>KEY IDEAS/DETAILS GRADES 9-10 Standard CC.3.5.9-10.A. Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.9-10B & Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.9-10.C Follow precisely a complex multistep procedure, etc...</p> <p>KEY IDEAS/DETAILS GRADES 11-12 Standard CC.3.5.11-12A Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.11-12.C. Follow precisely a complex multistep procedure, etc...</p> <p>CRAFT & STRUCTURE GRADES 9-10 Standard CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.9-10.E Analyze the structure of the relationships among concepts in a text. etc.</p> <p>Standard CC.3.5.9-10.F Analyze the author's purpose in providing an explanation, describing a procedure...</p> <p>CRAFT & STRUCTURE GRADES 11-12 Standard CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.11-12.E. Analyze the structure of the relationships among concepts in a text.</p> <p>Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...</p>	<p>TEXT TYPES AND PURPOSE GRADES 9-10 Standard CC.3.6.9-10.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>TEXT TYPES AND PURPOSE GRADES 11-12 Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10 Standard CC.3.6.9-10.C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.9-10.E Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 11-12 Standard CC.3.6...11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D. Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.11-12.E. Use technology, including the internet, to... share writing products.</p> <p>RESEARCH</p>	

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300 Interpret Electrical Symbols on Blueprints and Schematics

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<p>301 Identify and interpret electrical symbols, notes, details and components on schematics.</p> <p>302 Draw a schematic of electrical circuits, either by hand or by using computer software.</p>	<p>CLUSTER: <i>Science, Technology, Engineering and Math</i></p> <p>Choose Cluster Standards from: 1-2-3-4-5-6</p> <p>2 PATHWAYS: <i>Engineering and Technology Careers</i></p> <p>Choose Standards from: 1-2-3-4-5-6</p>	<p>KEY IDEAS/DETAILS GRADES 9-10 Standard CC.3.5.9-10.A. Cite specific textual evidence, etc.... Standard CC.3.5.9-10B & Determine the central ideas or conclusions of a text; etc... Standard CC.3.5.9-10.C Follow precisely a complex multistep procedure, etc...</p> <p>KEY IDEAS/DETAILS GRADES 11-12 Standard CC.3.5.11-12A Cite specific textual evidence, etc.... Standard CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; etc... Standard CC.3.5.11-12.C. Follow precisely a complex multistep procedure, etc...</p> <p>CRAFT & STRUCTURE GRADES 9-10 Standard CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain specific words... Standard CC.3.5.9-10.E Analyze the structure of the relationships among concepts in a text. etc. Standard CC.3.5.9-10.F Analyze the author's purpose in providing an explanation, describing a procedure...</p> <p>CRAFT & STRUCTURE GRADES 11-12 Standard CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain specific words... Standard CC.3.5.11-12.E. Analyze the structure of the relationships among concepts in a text. Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...</p>	<p>TEXT TYPES AND PURPOSE GRADES 9-10 Standard CC.3.6.9-10.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>TEXT TYPES AND PURPOSE GRADES 11-12 Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10 Standard CC.3.6.9-10.C Produce clear and coherent writing...appropriate to task, purpose, and audience. Standard CC.3.6.9-10 D Develop and strengthen writing as needed. Standard CC.3.6.9-10.E Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 11-12 Standard CC.3.6...11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience. Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D. Develop and strengthen writing as needed. Standard CC.3.6.11-12.E. Use technology, including the internet, to... share writing products.</p>	<p>ALGEBRA Standard. 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems. Standard. 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems. Standard. 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. Standard. 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers. Standard CC.2.4.HS.B.5 Make inferences and justify conclusions based on sample surveys, experiments, and observational studies. StandardCC.2.2.HS.D.3 Extend the knowledge of arithmetic operations and apply to polynomials. StandardCC.2.2.HS.D.8 Apply inverse operations to solve equations or formulas for a given variable. StandardCC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method. Standard CC.2.1.HS.F.3 Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs and data displays. areas of sectors of circles.</p>

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400 Demonstrate Knowledge of Basic Electricity

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<p>401 Describe the origins and applications of magnetism.</p> <p>402 Describe the idea of a magnetic force.</p> <p>403 Describe the atomic structure for materials.</p> <p>404 Describe the direction of electron flow in circuits.</p> <p>405 List the effect of electric current flow.</p> <p>406 Construct simple circuits.</p> <p>407 Define electricity.</p> <p>408 Describe what is meant by a charge of electricity.</p> <p>409 Describe the electrical force, which causes current flow.</p> <p>410 Describe the characteristics and purposes of good conductors of electricity.</p> <p>411 Demonstrate the use of prefixes in the metric system of measurement.</p> <p>412 Demonstrate knowledge of power.</p> <p>413 State Ohm's law.</p> <p>414 State Watt's Law.</p>	<p>CLUSTER: <i>Science, Technology, Engineering and Math</i></p> <p>Choose Cluster Standards from: 1-2-3-4-5-6</p> <p>2 PATHWAYS: <i>Engineering and Technology Careers</i></p> <p>Choose Standards from: 1-2-3-4-5-6</p>	<p>KEY IDEAS/DETAILS GRADES 9-10 Standard CC.3.5.9-10.A. Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.9-10B & Standard CC.3.5.9-10.C Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.9-10.C Follow precisely a complex multistep procedure, etc...</p> <p>KEY IDEAS/DETAILS GRADES 11-12 Standard CC.3.5.11-12.A Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.11-12.C. Follow precisely a complex multistep procedure, etc...</p> <p>CRAFT & STRUCTURE GRADES 9-10 Standard CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.9-10.E Analyze the structure of the relationships among concepts in a text. etc.</p> <p>Standard CC.3.5.9-10.F Analyze the author's purpose in providing an explanation, describing a procedure...</p> <p>CRAFT & STRUCTURE GRADES 11-12 Standard CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.11-12.E. Analyze the structure of the relationships among concepts in a text.</p> <p>Standard CC.3.5.11-12.F Analyze the author's purpose in providing</p>	<p>TEXT TYPES AND PURPOSE GRADES 9-10 Standard CC.3.6.9-10.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>TEXT TYPES AND PURPOSE GRADES 11-12 Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10 Standard CC.3.6.9-10.C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.9-10.E Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 11-12 Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D. Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.11-12.E. Use technology, including the internet, to... share writing products.</p>	<p>ALGEBRA Standard. 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.</p> <p>Standard. 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.</p> <p>Standard. 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p>Standard. 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p>Standard CC.2.4.HS.B.5 Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.</p> <p>StandardCC.2.2.HS.D.3 Extend the knowledge of arithmetic operations and apply to polynomials.</p> <p>StandardCC.2.2.HS.D.8 Apply inverse operations to solve equations or formulas for a given variable.</p> <p>StandardCC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method.</p> <p>Standard CC.2.1.HS.F.3 Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs and data displays.</p>

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500 Measure Components of Electrical Systems

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<p>501 Use an analog and a digital multi-meter to measure voltage, amperage and resistance.</p> <p>502 Use and care for analog and digital meters.</p> <p>503 Perform a continuity test.</p>	<p>CLUSTER: <i>Science, Technology, Engineering and Math</i></p> <p>Choose Cluster Standards from: 1-2-3-4-5-6</p> <p>2 PATHWAYS: <i>Engineering and Technology Careers</i></p> <p>Choose Standards from: 1-2-3-4-5-6</p>	<p>KEY IDEAS/DETAILS GRADES 9-10 Standard CC.3.5.9-10.A. Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.9-10B & Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.9-10.C Follow precisely a complex multistep procedure, etc...</p> <p>KEY IDEAS/DETAILS GRADES 11-12 Standard CC.3.5.11-12A Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.11-12.C. Follow precisely a complex multistep procedure, etc...</p> <p>CRAFT & STRUCTURE GRADES 9-10 Standard CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.9-10.E Analyze the structure of the relationships among concepts in a text. etc.</p> <p>Standard CC.3.5.9-10.F Analyze the author's purpose in providing an explanation, describing a procedure...</p> <p>CRAFT & STRUCTURE GRADES 11-12 Standard CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.11-12.E. Analyze the structure of the relationships among concepts in a text.</p> <p>Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...</p>	<p>TEXT TYPES AND PURPOSE GRADES 9-10 Standard CC.3.6.9-10.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>TEXT TYPES AND PURPOSE GRADES 11-12 Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10 Standard CC.3.6.9-10.C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.9-10.E Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 11-12 Standard CC.3.6...11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D. Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.11-12.E. Use technology, including the internet, to... share writing products.</p>	

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600 Use the National Electric Code (NEC) Reference Book

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<p>601 Describe regulations for wiring.</p> <p>602 Explain the NEC code for sizes and types of wire conductors, raceways and boxes.</p> <p>603 State the NEC rules for grounding and bonding.</p> <p>604 Describe the NEC rules for over current protection devices.</p> <p>605 Locate the NEC code for motor circuit wiring.</p> <p>606 Use the NEC reference book to locate regulations for industrial electrical installations.</p>	<p>CLUSTER: <i>Science, Technology, Engineering and Math</i></p> <p>Choose Cluster Standards from: 1-2-3-4-5-6</p> <p>2 PATHWAYS: <i>Engineering and Technology Careers</i></p> <p>Choose Standards from: 1-2-3-4-5-6</p>	<p>KEY IDEAS/DETAILS GRADES 9-10 Standard CC.3.5.9-10.A. Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.9-10B & Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.9-10.C Follow precisely a complex multistep procedure, etc...</p> <p>KEY IDEAS/DETAILS GRADES 11-12 Standard CC.3.5.11-12A Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.11-12.C. Follow precisely a complex multistep procedure, etc...</p> <p>CRAFT & STRUCTURE GRADES 9-10 Standard CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.9-10.E Analyze the structure of the relationships among concepts in a text. etc.</p> <p>Standard CC.3.5.9-10.F Analyze the author's purpose in providing an explanation, describing a procedure...</p> <p>CRAFT & STRUCTURE GRADES 11-12 Standard CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.11-12.E. Analyze the structure of the relationships among concepts in a text.</p> <p>Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...</p>	<p>TEXT TYPES AND PURPOSE GRADES 9-10 Standard CC.3.6.9-10.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>TEXT TYPES AND PURPOSE GRADES 11-12 Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10 Standard CC.3.6.9-10.C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.9-10.E Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 11-12 Standard CC.3.6...11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D. Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.11-12.E. Use technology, including the internet, to... share writing products.</p>	

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700 Demonstrate Knowledge of Electrical Resistance

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p>701 Define resistance. 702 Identify resistor materials. 703 Describe how length and thickness of wire affect resistance. 704 Measure resistance using a meter. 705 Calculate resistance. 706 Describe how the flow of an electric current generates heat. 707 Demonstrate knowledge of power in a resistor. 708 Calculate total resistance values. 709 Explain power dissipation in a resistor. 710 Describe the construction of a variable resistor. 711 Measure current flowing through a variable resistor. 712 Describe how a variable resistor is used as a potentiometer. 713 Demonstrate knowledge of resistor color coding. 714 Explain resistor tolerance. 715 Identify values for color coded resistors. 716 Demonstrate knowledge of resistors when connected in series and parallel circuits, and in combinations of series/parallel circuits.</p>	<p>CLUSTER: <i>Science, Technology, Engineering and Math</i> Choose Cluster Standards from: 1-2-3-4-5-6</p> <p>2 PATHWAYS: <i>Engineering and Technology Careers</i> Choose Standards from: 1-2-3-4-5-6</p>	<p>KEY IDEAS/DETAILS GRADES 9-10 Standard CC.3.5.9-10.A. Cite specific textual evidence, etc.... Standard CC.3.5.9-10B & Determine the central ideas or conclusions of a text; etc... Standard CC.3.5.9-10.C Follow precisely a complex multistep procedure, etc...</p> <p>KEY IDEAS/DETAILS GRADES 11-12 Standard CC.3.5.11-12A Cite specific textual evidence, etc.... Standard CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; etc... Standard CC.3.5.11-12.C. Follow precisely a complex multistep procedure, etc...</p> <p>CRAFT & STRUCTURE GRADES 9-10 Standard CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain specific words... Standard CC.3.5.9-10.E Analyze the structure of the relationships among concepts in a text. etc. Standard CC.3.5.9-10.F Analyze the author's purpose in providing an explanation, describing a procedure...</p> <p>CRAFT & STRUCTURE GRADES 11-12 Standard CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain specific words... Standard CC.3.5.11-12.E. Analyze the structure of the relationships among concepts in a text. Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...</p>	<p>TEXT TYPES AND PURPOSE GRADES 9-10 Standard CC.3.6.9-10.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>TEXT TYPES AND PURPOSE GRADES 11-12 Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10 Standard CC.3.6.9-10.C Produce clear and coherent writing...appropriate to task, purpose, and audience. Standard CC.3.6.9-10 D Develop and strengthen writing as needed. Standard CC.3.6.9-10.E Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 11-12 Standard CC.3.6...11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience. Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D. Develop and strengthen writing as needed. Standard CC.3.6.11-12.E. Use technology, including the internet, to... share writing products.</p>	<p>ALGEBRA Standard. 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems. Standard. 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems. Standard. 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. Standard. 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers. Standard CC.2.4.HS.B.5 Make inferences and justify conclusions based on sample surveys, experiments, and observational studies. StandardCC.2.2.HS.D.3 Extend the knowledge of arithmetic operations and apply to polynomials. StandardCC.2.2.HS.D.8 Apply inverse operations to solve equations or formulas for a given variable. StandardCC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method. Standard CC.2.1.HS.F.3 Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs and data displays. areas of sectors of circles.</p>

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800 Demonstrate Knowledge of Direct Current (D.C.) Motors

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p>801 Demonstrate knowledge of basic direct current circuits.</p> <p>802 Explain the theory of operation of a direct current motor.</p> <p>803 Operate and test a direct current motor.</p> <p>804 Operate and test a direct current shunt motor.</p> <p>805 Perform calculations for horsepower, speed and torque for direct current motors.</p> <p>806 Measure performance and efficiency of a direct current motor.</p> <p>807 Demonstrate knowledge of technical terms and units used in a basic direct current circuit.</p> <p>808 Demonstrate knowledge of the basic operations of variable speed control for direct current motors.</p>	<p>CLUSTER: <i>Science, Technology, Engineering and Math</i></p> <p>Choose Cluster Standards from: 1-2-3-4-5-6</p> <p>2 PATHWAYS: <i>Engineering and Technology Careers</i></p> <p>Choose Standards from: 1-2-3-4-5-6</p>	<p>KEY IDEAS/DETAILS GRADES 9-10 Standard CC.3.5.9-10.A. Cite specific textual evidence, etc.... Standard CC.3.5.9-10B & Determine the central ideas or conclusions of a text; etc... Standard CC.3.5.9-10.C Follow precisely a complex multistep procedure, etc...</p> <p>KEY IDEAS/DETAILS GRADES 11-12 Standard CC.3.5.11-12A Cite specific textual evidence, etc.... Standard CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; etc... Standard CC.3.5.11-12.C. Follow precisely a complex multistep procedure, etc...</p> <p>CRAFT & STRUCTURE GRADES 9-10 Standard CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain specific words... Standard CC.3.5.9-10.E Analyze the structure of the relationships among concepts in a text. etc. Standard CC.3.5.9-10.F Analyze the author's purpose in providing an explanation, describing a procedure...</p> <p>CRAFT & STRUCTURE GRADES 11-12 Standard CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain specific words... Standard CC.3.5.11-12.E. Analyze the structure of the relationships among concepts in a text. Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...</p>	<p>TEXT TYPES AND PURPOSE GRADES 9-10 Standard CC.3.6.9-10.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>TEXT TYPES AND PURPOSE GRADES 11-12 Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10 Standard CC.3.6.9-10.C Produce clear and coherent writing...appropriate to task, purpose, and audience. Standard CC.3.6.9-10 D Develop and strengthen writing as needed. Standard CC.3.6.9-10.E Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 11-12 Standard CC.3.6...11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience. Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D. Develop and strengthen writing as needed. Standard CC.3.6.11-12.E. Use technology, including the internet, to... share writing products.</p>	<p>ALGEBRA Standard. 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems. Standard. 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems. Standard. 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. Standard. 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.</p>

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900 Demonstrate Knowledge of Inductance and Capacitance

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p>901 Describe the operation of a capacitor.</p> <p>902 Calculate the time required to charge and discharge a capacitor.</p> <p>903 Demonstrate knowledge of capacitance and inductance circuits.</p> <p>904 Determine total capacitance of series and parallel circuits.</p> <p>905 Perform calculations for capacitive reactance.</p> <p>906 Analyze the effect of an inductor in a direct current and alternating current circuit.</p> <p>907 Connect an inductor in a direct current and alternating current circuit and monitor the results of current flow.</p>	<p>CLUSTER: <i>Science, Technology, Engineering and Math</i></p> <p>Choose Cluster Standards from: 1-2-3-4-5-6</p> <p>2 PATHWAYS: <i>Engineering and Technology Careers</i></p> <p>Choose Standards from: 1-2-3-4-5-6</p>	<p>KEY IDEAS/DETAILS GRADES 9-10 Standard CC.3.5.9-10.A. Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.9-10B & Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.9-10.C Follow precisely a complex multistep procedure, etc...</p> <p>KEY IDEAS/DETAILS GRADES 11-12 Standard CC.3.5.11-12A Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.11-12.C. Follow precisely a complex multistep procedure, etc...</p> <p>CRAFT & STRUCTURE GRADES 9-10 Standard CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.9-10.E Analyze the structure of the relationships among concepts in a text. etc.</p> <p>Standard CC.3.5.9-10.F Analyze the author's purpose in providing an explanation, describing a procedure...</p> <p>CRAFT & STRUCTURE GRADES 11-12 Standard CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.11-12.E. Analyze the structure of the relationships among concepts in a text.</p> <p>Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...</p>	<p>TEXT TYPES AND PURPOSE GRADES 9-10 Standard CC.3.6.9-10.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>TEXT TYPES AND PURPOSE GRADES 11-12 Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10 Standard CC.3.6.9-10.C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.</p> <p>Standard CC.3.6.9-10.E Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 11-12 Standard CC.3.6.11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach,</p>	<p>ALGEBRA Standard. 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.</p> <p>Standard. 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.</p> <p>Standard. 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p>Standard. 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p>Standard CC.2.4.HS.B.5 Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.</p> <p>StandardCC.2.2.HS.D.3 Extend the knowledge of arithmetic operations and apply to polynomials.</p> <p>StandardCC.2.2.HS.D.8 Apply inverse operations to solve equations or formulas for a given variable.</p> <p>StandardCC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method.</p> <p>Standard CC.2.1.HS.F.3 Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs and data displays. areas of sectors of circles.</p>

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		<p>INTEGRATE KNOWLEDGE/ IDEAS GRADES 9-10 Standard CC.3.5.9-10.G. Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart). Standard CC.3.5.9-10.H. Assess the reasoning in a text to support the author's claim for solving a technical problem. Standard CC.3.5.9-10.I. Compare and contrast findings presented in a text to those from other sources, etc...</p> <p>INTEGRATE KNOWLEDGE/ IDEAS GRADES 11-12 Standard CC.3.5.11-12.G. Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem. Standard CC.3.5.11-12.H. Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible. Standard CC.3.5.11-12.I. Synthesize information from a range of sources into a coherent understanding.</p> <p>RANGE OF READING GRADES 9-10-11-12 Standard CC.3.5.9-10.J AND Standard CC.3.5.11-12.J. By the end of grades 9-10, AND 11-12, read and comprehend technical texts independently and proficiently.</p>	<p>focusing on addressing what is most significant for a specific purpose and audience. Standard CC.3.6.11-12.E. Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p>RANGE OF WRITING GRADES 9-10-11-12 Standard CC.3.5.9-10.I AND Standard CC.3.5.11-12.I. Write routinely over extended time frames and shorter time frames for a range of tasks, purposes and audiences...etc.</p>	

1000 Demonstrate Knowledge of Alternating Current (A.C.) Motors

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p>1001 Explain the theory of operation of alternating current motors.</p> <p>1002 Calculate the synchronous speed of an alternating current motor.</p> <p>1003 Describe operating characteristics of capacitor start motors.</p> <p>1004 Connect and operate split phase and capacitor start motors.</p> <p>1005 Reverse the rotation of a split phase motor.</p> <p>1006 Describe the force between two magnetic fields.</p> <p>1007 Determine operating characteristics of universal motors.</p> <p>1008 Connect and operate a three phase, squirrel cage motor.</p> <p>1009 Demonstrate how to reverse the rotation of a three phase motor.</p>	<p>CLUSTER: <i>Science, Technology, Engineering and Math</i></p> <p>Choose Cluster Standards from: 1-2-3-4-5-6</p> <p>2 PATHWAYS: <i>Engineering and Technology Careers</i></p> <p>Choose Standards from: 1-2-3-4-5-6</p>	<p>KEY IDEAS/DETAILS GRADES 9-10 Standard CC.3.5.9-10.A. Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.9-10B & Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.9-10.C Follow precisely a complex multistep procedure, etc...</p> <p>KEY IDEAS/DETAILS GRADES 11-12 Standard CC.3.5.11-12A Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.11-12.C. Follow precisely a complex multistep procedure, etc...</p> <p>CRAFT & STRUCTURE GRADES 9-10 Standard CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.9-10.E Analyze the structure of the relationships among concepts in a text. etc.</p> <p>Standard CC.3.5.9-10.F Analyze the author's purpose in providing an explanation, describing a procedure...</p> <p>CRAFT & STRUCTURE GRADES 11-12 Standard CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.11-12.E. Analyze the structure of the relationships among concepts in a text.</p> <p>Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...</p>	<p>TEXT TYPES AND PURPOSE GRADES 9-10 Standard CC.3.6.9-10.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>TEXT TYPES AND PURPOSE GRADES 11-12 Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10 Standard CC.3.6.9-10.C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.9-10.E Use technology, including the internet, to produce, publish, and update individual or shared writing products.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 11-12 Standard CC.3.6...11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D. Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.11-12.E. Use technology, including the internet, to... share writing products.</p>	<p>ALGEBRA Standard. 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.</p> <p>Standard. 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.</p> <p>Standard. 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p>Standard. 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.</p>

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1100 Demonstrate Knowledge of Series/Parallel Circuits

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p>1101 Build and test a series circuit. 1102 Build and test a parallel circuit. 1103 Build and test a series/parallel circuit. 1104 Troubleshoot series and parallel circuits. 1105 Calculate voltage, current and resistance. 1106 Measure voltage, current and resistance.</p>	<p>CLUSTER: <i>Science, Technology, Engineering and Math</i> Choose Cluster Standards from: 1-2-3-4-5-6</p> <p>2 PATHWAYS: <i>Engineering and Technology Careers</i> Choose Standards from: 1-2-3-4-5-6</p>	<p>KEY IDEAS/DETAILS GRADES 9-10 Standard CC.3.5.9-10.A. Cite specific textual evidence, etc.... Standard CC.3.5.9-10B & Determine the central ideas or conclusions of a text; etc... Standard CC.3.5.9-10.C Follow precisely a complex multistep procedure, etc...</p> <p>KEY IDEAS/DETAILS GRADES 11-12 Standard CC.3.5.11-12A Cite specific textual evidence, etc.... Standard CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; etc... Standard CC.3.5.11-12.C. Follow precisely a complex multistep procedure, etc...</p> <p>CRAFT & STRUCTURE GRADES 9-10 Standard CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain specific words... Standard CC.3.5.9-10.E Analyze the structure of the relationships among concepts in a text. etc. Standard CC.3.5.9-10.F Analyze the author's purpose in providing an explanation, describing a procedure...</p> <p>CRAFT & STRUCTURE GRADES 11-12 Standard CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain specific words... Standard CC.3.5.11-12.E. Analyze the structure of the relationships among concepts in a text. Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...</p>	<p>TEXT TYPES AND PURPOSE GRADES 9-10 Standard CC.3.6.9-10.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>TEXT TYPES AND PURPOSE GRADES 11-12 Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10 Standard CC.3.6.9-10.C Produce clear and coherent writing...appropriate to task, purpose, and audience. Standard CC.3.6.9-10 D Develop and strengthen writing as needed. Standard CC.3.6.9-10.E Use technology, including the Internet, to share writing products.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 11-12 Standard CC.3.6...11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience. Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D. Develop and strengthen writing as needed. Standard CC.3.6.11-12.E. Use technology, including the internet, to... share writing products.</p> <p>RESEARCH GRADES 9-10</p>	<p>ALGEBRA Standard. 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems. Standard. 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems. Standard. 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. Standard. 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers. StandardCC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method. Standard CC.2.4.HS.B.5 Make inferences and justify conclusions based on sample surveys, experiments, and observational studies. StandardCC.2.2.HS.D.3 Extend the knowledge of arithmetic operations and apply to polynomials. StandardCC.2.2.HS.D.8 Apply inverse operations to solve equations or formulas for a given variable. StandardCC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method. Standard CC.2.1.HS.F.3 Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs and data displays. areas of sectors of circles.</p>

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
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1200 Demonstrate Knowledge of Electric Motor Controls

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p>1201 Identify symbols and terms used in electromechanical motor control circuits.</p> <p>1202 Identify relays, contactors and motor starters.</p> <p>1203 Read schematic wiring diagrams of motors and their controls.</p> <p>1204 Wire a simple two and three wire motor control circuit.</p> <p>1205 Wire a reversing starter.</p> <p>1206 Wire multiple push button/jogging control circuits.</p> <p>1207 Wire sequential control circuits.</p> <p>1208 Wire and test electrical control circuits.</p> <p>1209 Perform preventive maintenance and troubleshooting on motor controls. Identify and describe classes of wire insulation.</p> <p>1211 Describe conductor ampacity.</p> <p>1212 Describe how to select wire size and wire type for a specific wiring application.</p> <p>1213 Demonstrate procedures for the correct labeling of wires.</p> <p>1214 Interpret electrical diagrams.</p>	<p>CLUSTER: <i>Science, Technology, Engineering and Math</i></p> <p>Choose Cluster Standards from: 1-2-3-4-5-6</p> <p>2 PATHWAYS: <i>Engineering and Technology Careers</i></p> <p>Choose Standards from: 1-2-3-4-5-6</p>	<p>KEY IDEAS/DETAILS GRADES 9-10 Standard CC.3.5.9-10.A. Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.9-10B & Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.9-10.C Follow precisely a complex multistep procedure, etc...</p> <p>KEY IDEAS/DETAILS GRADES 11-12 Standard CC.3.5.11-12A Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.11-12.C. Follow precisely a complex multistep procedure, etc...</p> <p>CRAFT & STRUCTURE GRADES 9-10 Standard CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.9-10.E Analyze the structure of the relationships among concepts in a text. etc.</p> <p>Standard CC.3.5.9-10.F Analyze the author's purpose in providing an explanation, describing a procedure...</p> <p>CRAFT & STRUCTURE GRADES 11-12 Standard CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.11-12.E. Analyze the structure of the relationships among concepts in a text.</p> <p>Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...</p>	<p>TEXT TYPES AND PURPOSE GRADES 9-10 Standard CC.3.6.9-10.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>TEXT TYPES AND PURPOSE GRADES 11-12 Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10 Standard CC.3.6.9-10.C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.9-10.E Use technology, including the Internet, to share writing products.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 11-12 Standard CC.3.6...11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D. Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.11-12.E. Use technology, including the internet, to... share writing products.</p> <p>RESEARCH GRADES 9-10</p>	<p>ALGEBRA Standard. 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.</p> <p>Standard. 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.</p> <p>Standard. 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p>Standard. 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p>Standard CC.2.4.HS.B.5 Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.</p> <p>StandardCC.2.2.HS.D.3 Extend the knowledge of arithmetic operations and apply to polynomials.</p> <p>StandardCC.2.2.HS.D.8 Apply inverse operations to solve equations or formulas for a given variable.</p> <p>StandardCC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method.</p> <p>Standard CC.2.1.HS.F.3 Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs and data displays. to determine arc lengths and areas of sectors of circles.</p>

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
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1300 Demonstrate Knowledge of Transformers

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p>1301 Connect and operate a transformer.</p> <p>1302 Calculate the voltage and turns ratio.</p> <p>1303 Connect a step-up and a step-down transformer in a circuit.</p> <p>1304 Identify transformer windings and related output voltages.</p> <p>1305 Determine on load voltages and currents.</p> <p>1306 Measure single phase transformer voltage and currents.</p> <p>1307 Measure series/parallel transformer voltages and currents.</p> <p>1308 Demonstrate knowledge of three phase transformers.</p> <p>1309 Wire and analyze three phase transformers.</p>	<p>CLUSTER: <i>Science, Technology, Engineering and Math</i></p> <p>Choose Cluster Standards from: 1-2-3-4-5-6</p> <p>2 PATHWAYS: <i>Engineering and Technology Careers</i></p> <p>Choose Standards from: 1-2-3-4-5-6</p>	<p>KEY IDEAS/DETAILS GRADES 9-10 Standard CC.3.5.9-10.A. Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.9-10B & Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.9-10.C Follow precisely a complex multistep procedure, etc...</p> <p>KEY IDEAS/DETAILS GRADES 11-12 Standard CC.3.5.11-12A Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.11-12.C. Follow precisely a complex multistep procedure, etc...</p> <p>CRAFT & STRUCTURE GRADES 9-10 Standard CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.9-10.E Analyze the structure of the relationships among concepts in a text. etc.</p> <p>Standard CC.3.5.9-10.F Analyze the author's purpose in providing an explanation, describing a procedure...</p> <p>CRAFT & STRUCTURE GRADES 11-12 Standard CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.11-12.E. Analyze the structure of the relationships among concepts in a text.</p> <p>Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...</p>	<p>TEXT TYPES AND PURPOSE GRADES 9-10 Standard CC.3.6.9-10.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>TEXT TYPES AND PURPOSE GRADES 11-12 Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10 Standard CC.3.6.9-10.C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.9-10.E Use technology, including the Internet, to share writing products.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 11-12 Standard CC.3.6...11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Standard CC.3.6.11-12.D. Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.11-12.E. Use technology, including the internet, to... share writing products.</p> <p>RESEARCH GRADES 9-10</p>	<p>ALGEBRA Standard. 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.</p> <p>Standard. 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.</p> <p>Standard. 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p>Standard. 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p>Standard CC.2.4.HS.B.5 Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.</p> <p>StandardCC.2.2.HS.D.3 Extend the knowledge of arithmetic operations and apply to polynomials.</p> <p>StandardCC.2.2.HS.D.8 Apply inverse operations to solve equations or formulas for a given variable.</p> <p>StandardCC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method.</p> <p>Standard CC.2.1.HS.F.3 Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs and data displays. areas of sectors of circles.</p>

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
		<p>INTEGRATE KNOWLEDGE/ IDEAS GRADES 9-10 Standard CC.3.5.9-10.G. Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart). Standard CC.3.5.9-10.H. Assess the reasoning in a text to support the author's claim for solving a technical problem. Standard CC.3.5.9-10.I. Compare and contrast findings presented in a text to those from other sources, etc...</p> <p>INTEGRATE KNOWLEDGE/ IDEAS GRADES 11-12 Standard CC.3.5.11-12.G. Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem. Standard CC.3.5.11-12.H. Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible. Standard CC.3.5.11-12.I. Synthesize information from a range of sources into a coherent understanding.</p> <p>RANGE OF READING GRADES 9-10-11-12 Standard CC.3.5.9-10.J AND Standard CC.3.5.11-12.J. By the end of grades 9-10, AND 11-12, read and comprehend technical texts independently and proficiently.</p>	<p>Standard CC.3.6.9-10.F. Conduct short and more sustained research. Standard CC.3.6.9-10.G. Gather relevant information. Standard CC.3.6.9-10.H. Draw evidence from informational texts.</p> <p>RESEARCH GRADES 11-12 Standard CC.3.6.11-12.F. Conduct short and more sustained research. Standard CC.3.6.11-12.G. Gather relevant information. Standard CC.3.6.11-12.H. Draw evidence from informational texts for research.</p> <p>RANGE OF WRITING GRADES 9-10-11-12 Standard CC.3.5.9-10.I and Standard CC.3.5.11-12.I. Write over extended and shorter time frames for a range of tasks, purposes and audiences...etc.</p>	

1400 Demonstrate Knowledge of Soldering Techniques

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p>1401 Describe proper care for soldering equipment.</p> <p>1402 Demonstrate proper soldering techniques for splicing conductors.</p> <p>1403 Demonstrate proper soldering techniques for terminals.</p>	<p>CLUSTER: <i>Science, Technology, Engineering and Math</i> Choose Cluster Standards from: 1-2-3-4-5-6</p> <p>2 PATHWAYS: <i>Engineering and Technology Careers</i> Choose Standards from: 1-2-3-4-5-6</p>	<p>KEY IDEAS/DETAILS GRADES 9-10 Standard CC.3.5.9-10.A. Cite specific textual evidence, etc.... Standard CC.3.5.9-10B & Determine the central ideas or conclusions of a text; etc... Standard CC.3.5.9-10.C Follow precisely a complex multistep procedure, etc...</p> <p>KEY IDEAS/DETAILS GRADES 11-12 Standard CC.3.5.11-12A Cite specific textual evidence, etc.... Standard CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; etc... Standard CC.3.5.11-12.C. Follow precisely a complex multistep procedure, etc...</p> <p>CRAFT & STRUCTURE GRADES 9-10 Standard CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain specific words... Standard CC.3.5.9-10.E Analyze the structure of the relationships among concepts in a text. etc. Standard CC.3.5.9-10.F Analyze the author's purpose in providing an explanation, describing a procedure...</p> <p>CRAFT & STRUCTURE GRADES 11-12 Standard CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain specific words... Standard CC.3.5.11-12.E. Analyze the structure of the relationships among concepts in a text. Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...</p>	<p>TEXT TYPES AND PURPOSE GRADES 9-10 Standard CC.3.6.9-10.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>TEXT TYPES AND PURPOSE GRADES 11-12 Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10 Standard CC.3.6.9-10.C Produce clear and coherent writing...appropriate to task, purpose, and audience. Standard CC.3.6.9-10 D Develop and strengthen writing as needed. Standard CC.3.6.9-10.E Use technology, including the Internet, to share writing products.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 11-12 Standard CC.3.6...11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience. Standard CC.3.6.9-10 D Develop and strengthen writing as needed. Standard CC.3.6.11-12.D. Develop and strengthen writing as needed. Standard CC.3.6.11-12.E. Use technology, including the internet, to... share writing products.</p>	

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		<p>INTEGRATE KNOWLEDGE/ IDEAS GRADES 9-10 Standard CC.3.5.9-10.G. Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart). Standard CC.3.5.9-10.H. Assess the reasoning in a text to support the author's claim for solving a technical problem. Standard CC.3.5.9-10.I. Compare and contrast findings presented in a text to those from other sources, etc...</p> <p>INTEGRATE KNOWLEDGE/ IDEAS GRADES 11-12 Standard CC.3.5.11-12.G. Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem. Standard CC.3.5.11-12.H. Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible. Standard CC.3.5.11-12.I. Synthesize information from a range of sources into a coherent understanding.</p> <p>RANGE OF READING GRADES 9-10-11-12 Standard CC.3.5.9-10.J AND Standard CC.3.5.11-12.J. By the end of grades 9-10, AND 11-12, read and comprehend technical texts independently and proficiently.</p>	<p>RESEARCH GRADES 9-10 Standard CC.3.6.9-10.F. Conduct short and more sustained research. Standard CC.3.6.9-10.G. Gather relevant information. Standard CC.3.6.9-10.H. Draw evidence from informational texts.</p> <p>RESEARCH GRADES 11-12 Standard CC.3.6.11-12.F. Conduct short and more sustained research. Standard CC.3.6.11-12.G. Gather relevant information. Standard CC.3.6.11-12.H. Draw evidence from informational texts for research.</p> <p>RANGE OF WRITING GRADES 9-10-11-12 Standard CC.3.5.9-10.I and Standard CC.3.5.11-12.I. Write over extended and shorter time frames for a range of tasks, purposes and audiences...etc.</p>	

1500 Troubleshoot and Repair Electrical Devices in the Laboratory

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p>1501 Troubleshoot and repair motor controls.</p> <p>1502 Troubleshoot and replace relays.</p> <p>1503 Troubleshoot and replace sensors.</p> <p>1504 Troubleshoot and replace limit switches.</p> <p>1505 Troubleshoot and replace power supplies.</p> <p>1506 Troubleshoot and replace electronic sensors.</p>	<p>CLUSTER: <i>Science, Technology, Engineering and Math</i> Choose Cluster Standards from: 1-2-3-4-5-6</p> <p>2 PATHWAYS: <i>Engineering and Technology Careers</i> Choose Standards from: 1-2-3-4-5-6</p>	<p>KEY IDEAS/DETAILS GRADES 9-10 Standard CC.3.5.9-10.A. Cite specific textual evidence, etc.... Standard CC.3.5.9-10B & Determine the central ideas or conclusions of a text; etc... Standard CC.3.5.9-10.C Follow precisely a complex multistep procedure, etc...</p> <p>KEY IDEAS/DETAILS GRADES 11-12 Standard CC.3.5.11-12A Cite specific textual evidence, etc.... Standard CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; etc... Standard CC.3.5.11-12.C. Follow precisely a complex multistep procedure, etc...</p> <p>CRAFT & STRUCTURE GRADES 9-10 Standard CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain specific words... Standard CC.3.5.9-10.E Analyze the structure of the relationships among concepts in a text. etc. Standard CC.3.5.9-10.F Analyze the author's purpose in providing an explanation, describing a procedure...</p> <p>CRAFT & STRUCTURE GRADES 11-12 Standard CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain specific words... Standard CC.3.5.11-12.E. Analyze the structure of the relationships among concepts in a text. Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...</p>	<p>TEXT TYPES AND PURPOSE GRADES 9-10 Standard CC.3.6.9-10.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>TEXT TYPES AND PURPOSE GRADES 11-12 Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10 Standard CC.3.6.9-10.C Produce clear and coherent writing...appropriate to task, purpose, and audience. Standard CC.3.6.9-10 D Develop and strengthen writing as needed. Standard CC.3.6.9-10.E Use technology, including the Internet, to share writing products.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 11-12 Standard CC.3.6...11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience. Standard CC.3.6.9-10 D Develop and strengthen writing as needed. Standard CC.3.6.11-12.D. Develop and strengthen writing as needed. Standard CC.3.6.11-12.E. Use technology, including the internet, to... share writing products.</p>	<p>ALGEBRA Standard. 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems. Standard. 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems. Standard. 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. Standard. 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers. Standard CC.2.4.HS.B.5 Make inferences and justify conclusions based on sample surveys, experiments, and observational studies. StandardCC.2.2.HS.D.3 Extend the knowledge of arithmetic operations and apply to polynomials. StandardCC.2.2.HS.D.8 Apply inverse operations to solve equations or formulas for a given variable. StandardCC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method. Standard CC.2.1.HS.F.3 Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs and data displays.</p>

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
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1600 Demonstrate Knowledge of Basic Electronics

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p>1601 Identify and explain electronic symbols shown on diagrams and schematics.</p> <p>1602 Describe and explain the function of diodes.</p> <p>1603 Explain the function of Zener diodes.</p> <p>1604 Explain the function of transistors.</p> <p>1605 Explain the function of power supplies.</p> <p>1606 Explain the function of filters.</p> <p>1607 Explain the function of half wave, full wave and three phase rectifiers.</p> <p>1608 Explain the function of thyristors.</p> <p>1609 Explain the function of single phase and three phase inverters.</p> <p>1610 Connect and operate alternating current and direct current variable speed drives.</p> <p>1611 Troubleshoot alternating current and direct current variable speed drives.</p>	<p>CLUSTER: <i>Science, Technology, Engineering and Math</i></p> <p>Choose Cluster Standards from: 1-2-3-4-5-6</p> <p>2 PATHWAYS: <i>Engineering and Technology Careers</i></p> <p>Choose Standards from: 1-2-3-4-5-6</p>	<p>KEY IDEAS/DETAILS GRADES 9-10 Standard CC.3.5.9-10.A. Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.9-10B & Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.9-10.C Follow precisely a complex multistep procedure, etc...</p> <p>KEY IDEAS/DETAILS GRADES 11-12 Standard CC.3.5.11-12A Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.11-12.C. Follow precisely a complex multistep procedure, etc...</p> <p>CRAFT & STRUCTURE GRADES 9-10 Standard CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.9-10.E Analyze the structure of the relationships among concepts in a text. etc.</p> <p>Standard CC.3.5.9-10.F Analyze the author's purpose in providing an explanation, describing a procedure...</p> <p>CRAFT & STRUCTURE GRADES 11-12 Standard CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.11-12.E. Analyze the structure of the relationships among concepts in a text.</p> <p>Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...</p>	<p>TEXT TYPES AND PURPOSE GRADES 9-10 Standard CC.3.6.9-10.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>TEXT TYPES AND PURPOSE GRADES 11-12 Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10 Standard CC.3.6.9-10.C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.9-10.E Use technology, including the Internet, to share writing products.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 11-12 Standard CC.3.6...11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.11-12.D. Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.11-12.E. Use technology, including the internet, to... share writing products.</p>	<p>ALGEBRA Standard. 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.</p> <p>Standard. 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.</p> <p>Standard. 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p>Standard. 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p>Standard CC.2.4.HS.B.5 Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.</p> <p>StandardCC.2.2.HS.D.3 Extend the knowledge of arithmetic operations and apply to polynomials.</p> <p>StandardCC.2.2.HS.D.8 Apply inverse operations to solve equations or formulas for a given variable.</p> <p>StandardCC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method.</p> <p>Standard CC.2.1.HS.F.3 Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs and data displays.</p>

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
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1700 Basic Logic Functions

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p>1701 Demonstrate knowledge of number systems.</p> <p>1702 Convert binary and decimal number systems.</p> <p>1703 Convert BCD and decimal number systems.</p> <p>1704 Convert octal and decimal number systems.</p> <p>1705 Convert hexadecimal and decimal number systems.</p> <p>1706 Demonstrate knowledge of switch logic.</p> <p>1707 Identify characteristics of and, or, nand, nor, not logic.</p> <p>1708 Demonstrate knowledge of and, or, nand, nor, not logic.</p>	<p>CLUSTER: <i>Science, Technology, Engineering and Math</i></p> <p>Choose Cluster Standards from: 1-2-3-4-5-6</p> <p>2 PATHWAYS: <i>Engineering and Technology Careers</i></p> <p>Choose Standards from: 1-2-3-4-5-6</p>	<p>KEY IDEAS/DETAILS GRADES 9-10 Standard CC.3.5.9-10.A. Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.9-10B & Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.9-10.C Follow precisely a complex multistep procedure, etc...</p> <p>KEY IDEAS/DETAILS GRADES 11-12 Standard CC.3.5.11-12A Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.11-12.C. Follow precisely a complex multistep procedure, etc...</p> <p>CRAFT & STRUCTURE GRADES 9-10 Standard CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.9-10.E Analyze the structure of the relationships among concepts in a text. etc.</p> <p>Standard CC.3.5.9-10.F Analyze the author's purpose in providing an explanation, describing a procedure...</p> <p>CRAFT & STRUCTURE GRADES 11-12 Standard CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.11-12.E. Analyze the structure of the relationships among concepts in a text.</p> <p>Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...</p>	<p>TEXT TYPES AND PURPOSE GRADES 9-10 Standard CC.3.6.9-10.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>TEXT TYPES AND PURPOSE GRADES 11-12 Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10 Standard CC.3.6.9-10.C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.9-10.E Use technology, including the Internet, to share writing products.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 11-12 Standard CC.3.6...11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.11-12.D. Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.11-12.E. Use technology, including the internet, to... share writing products.</p>	<p>ALGEBRA Standard. 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.</p> <p>Standard. 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.</p> <p>Standard. 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p>Standard. 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p>Standard CC.2.4.HS.B.5 Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.</p> <p>StandardCC.2.2.HS.D.3 Extend the knowledge of arithmetic operations and apply to polynomials.</p> <p>StandardCC.2.2.HS.D.8 Apply inverse operations to solve equations or formulas for a given variable.</p> <p>StandardCC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method.</p> <p>Standard CC.2.1.HS.F.3 Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs and data displays.</p>

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1800 Demonstrate Knowledge of Programmable Logic Controls (PLCs)

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p>1801 Explain where PLC networks may be used in the manufacturing process.</p> <p>1802 Identify the parts and operating principles of programmable logic controls.</p> <p>1803 Demonstrate knowledge of number systems and codes for PLCs.</p> <p>1804 Create a relay logic diagram.</p> <p>1805 Describe the PLC logic gate functions in PLCs.</p> <p>1806 Explain PLC logic and math functions.</p> <p>1807 Explain PLC timer and counter functions.</p> <p>1808 Describe PLC jump, compare and subroutine functions.</p> <p>1809 Demonstrate procedures for editing PLC programs.</p> <p>1810 Troubleshoot a PLC system.</p>	<p>CLUSTER: <i>Science, Technology, Engineering and Math</i> Choose Cluster Standards from: 1-2-3-4-5-6</p> <p>2 PATHWAYS: <i>Engineering and Technology Careers</i> Choose Standards from: 1-2-3-4-5-6</p>	<p>KEY IDEAS/DETAILS GRADES 9-10 Standard CC.3.5.9-10.A. Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.9-10B & Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.9-10.C Follow precisely a complex multistep procedure, etc...</p> <p>KEY IDEAS/DETAILS GRADES 11-12 Standard CC.3.5.11-12A Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.11-12.C. Follow precisely a complex multistep procedure, etc...</p> <p>CRAFT & STRUCTURE GRADES 9-10 Standard CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.9-10.E Analyze the structure of the relationships among concepts in a text. etc.</p> <p>Standard CC.3.5.9-10.F Analyze the author's purpose in providing an explanation, describing a procedure...</p> <p>CRAFT & STRUCTURE GRADES 11-12 Standard CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.11-12.E. Analyze the structure of the relationships among concepts in a text.</p> <p>Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...</p>	<p>TEXT TYPES AND PURPOSE GRADES 9-10 Standard CC.3.6.9-10.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>TEXT TYPES AND PURPOSE GRADES 11-12 Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10 Standard CC.3.6.9-10.C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.9-10.E Use technology, including the Internet, to share writing products.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 11-12 Standard CC.3.6...11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.11-12.D. Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.11-12.E. Use technology, including the internet, to... share writing products.</p>	<p>ALGEBRA Standard. 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.</p> <p>Standard. 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.</p> <p>Standard. 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p>Standard. 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p>Standard CC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method.</p> <p>Standard CC.2.1.HS.F.3 Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs and data displays.</p>

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1900 Demonstrate Knowledge of Mechanical Power Transmission Systems in Industry

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p>1901 Identify vocabulary words and terms associated with the fundamental principles of the transmission of mechanical power.</p> <p>1902 Construct simple machines and use them to illustrate mechanical principles.</p> <p>1903 Identify basic principles of lubrication of bearings.</p> <p>1904 Identify basic principles of installing and adjusting V-belts.</p> <p>1905 Demonstrate knowledge of the uses of brakes and clutches for mechanical power transmission.</p> <p>1906 Demonstrate knowledge of the uses of various pumps.</p>	<p>CLUSTER: <i>Science, Technology, Engineering and Math</i></p> <p>Choose Cluster Standards from: 1-2-3-4-5-6</p> <p>2 PATHWAYS: <i>Engineering and Technology Careers</i></p> <p>Choose Standards from: 1-2-3-4-5-6</p>	<p>KEY IDEAS/DETAILS GRADES 9-10 Standard CC.3.5.9-10.A. Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.9-10B & Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.9-10.C Follow precisely a complex multistep procedure, etc...</p> <p>KEY IDEAS/DETAILS GRADES 11-12 Standard CC.3.5.11-12A Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.11-12.C. Follow precisely a complex multistep procedure, etc...</p> <p>CRAFT & STRUCTURE GRADES 9-10 Standard CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.9-10.E Analyze the structure of the relationships among concepts in a text. etc.</p> <p>Standard CC.3.5.9-10.F Analyze the author's purpose in providing an explanation, describing a procedure...</p> <p>CRAFT & STRUCTURE GRADES 11-12 Standard CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.11-12.E. Analyze the structure of the relationships among concepts in a text.</p> <p>Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...</p>	<p>TEXT TYPES AND PURPOSE GRADES 9-10 Standard CC.3.6.9-10.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>TEXT TYPES AND PURPOSE GRADES 11-12 Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10 Standard CC.3.6.9-10.C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.9-10.E Use technology, including the Internet, to share writing products.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 11-12 Standard CC.3.6...11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.11-12.D. Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.11-12.E. Use technology, including the internet, to... share writing products.</p>	<p>ALGEBRA Standard. 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.</p> <p>Standard. 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.</p> <p>Standard. 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p>Standard. 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p>Standard CC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method.</p> <p>Standard CC.2.1.HS.F.3 Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs and data displays.</p>

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2000 Troubleshoot/Repair Mechanical Power Transmission Systems

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<p>2001 Set and adjust mechanical stops.</p> <p>2002 Install and maintain linkages.</p> <p>2003 Install and maintain gear trains.</p> <p>2004 Conduct routine preventive maintenance on hydraulic equipment in accordance with manufacturer's instructions.</p> <p>2005 Determine speed and torque rates of mechanical equipment components.</p> <p>2006 Troubleshoot and repair or replace A.C. pump motors.</p> <p>2007 Troubleshoot and repair or replace speed reduction units.</p> <p>2008 Troubleshoot and repair or replace clutches.</p> <p>2009 Troubleshoot and repair or replace mechanical drives for feedback systems.</p> <p>2010 Troubleshoot and repair or replace sensors for flow control.</p>	<p>CLUSTER: <i>Science, Technology, Engineering and Math</i></p> <p>Choose Cluster Standards from: 1-2-3-4-5-6</p> <p>2 PATHWAYS: <i>Engineering and Technology Careers</i></p> <p>Choose Standards from: 1-2-3-4-5-6</p>	<p>KEY IDEAS/DETAILS GRADES 9-10 Standard CC.3.5.9-10.A. Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.9-10B & Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.9-10.C Follow precisely a complex multistep procedure, etc...</p> <p>KEY IDEAS/DETAILS GRADES 11-12 Standard CC.3.5.11-12A Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.11-12.C. Follow precisely a complex multistep procedure, etc...</p> <p>CRAFT & STRUCTURE GRADES 9-10 Standard CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.9-10.E Analyze the structure of the relationships among concepts in a text. etc.</p> <p>Standard CC.3.5.9-10.F Analyze the author's purpose in providing an explanation, describing a procedure...</p> <p>CRAFT & STRUCTURE GRADES 11-12 Standard CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.11-12.E. Analyze the structure of the relationships among concepts in a text.</p> <p>Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...</p>	<p>TEXT TYPES AND PURPOSE GRADES 9-10 Standard CC.3.6.9-10.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>TEXT TYPES AND PURPOSE GRADES 11-12 Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10 Standard CC.3.6.9-10.C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.9-10.E Use technology, including the Internet, to share writing products.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 11-12 Standard CC.3.6...11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.11-12.D. Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.11-12.E. Use technology, including the internet, to... share writing products.</p>	<p>ALGEBRA Standard. 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.</p> <p>Standard. 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.</p> <p>Standard. 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p>Standard. 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p>Standard CC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method.</p> <p>Standard CC.2.1.HS.F.3 Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs and data displays.</p>

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2100 Demonstrate Knowledge of Fluid Power Systems

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p>2101 Identify electrical symbols and schematics for hydraulic systems.</p> <p>2102 Describe electric and electronic control circuits, devices, and feedback as they relate to hydraulics.</p> <p>2103 Demonstrate knowledge of the fundamentals of hydraulics.</p> <p>2104 Examine characteristics of hydraulic pumps.</p> <p>2105 Explain the transmission and conditioning of hydraulic fluid.</p> <p>2106 Measure oil flow and oil pressure.</p> <p>2107 Demonstrate the operation of manual and pilot directional control valves.</p> <p>2108 Describe and explain hydraulic actuators.</p> <p>2109 Operate hydraulic actuator circuits.</p> <p>2110 Construct, test and troubleshoot hydraulic control circuits.</p> <p>2111 Apply knowledge of basic electricity in analyzing hydraulic circuits.</p> <p>2112 Explain where electronic switches and sensors may be found in hydraulic systems.</p> <p>2113 Identify and use proper size hydraulic lines.</p> <p>2114 Describe the relationship between hydraulic pressure and flow.</p> <p>2115 Troubleshoot and replace hydraulic lines.</p> <p>2116 Troubleshoot and replace hydraulic pumps.</p> <p>2117 Troubleshoot and replace hydraulic gauges.</p> <p>2118 Troubleshoot and replace hydraulic filters.</p> <p>2119 Troubleshoot and replace hydraulic directional control valves.</p> <p>2120 Troubleshoot and replace hydraulic pressure control valves.</p> <p>2121 Perform adjustments to control oil temperature and pressure.</p> <p>2122 Conduct routine preventive maintenance on hydraulic equipment in accordance with manufacturer's instructions.</p> <p>2123 Identify electrical symbols/schematics for pneumatics.</p>	<p>CLUSTER: <i>Science, Technology, Engineering and Math</i></p> <p>Choose Cluster Standards from: 1-2-3-4-5-6</p> <p>2 PATHWAYS: <i>Engineering and Technology Careers</i></p> <p>Choose Standards from: 1-2-3-4-5-6</p>	<p>KEY IDEAS/DETAILS GRADES 9-10 Standard CC.3.5.9-10.A. Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.9-10B & Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.9-10.C Follow precisely a complex multistep procedure, etc...</p> <p>KEY IDEAS/DETAILS GRADES 11-12 Standard CC.3.5.11-12A Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.11-12.C. Follow precisely a complex multistep procedure, etc...</p> <p>CRAFT & STRUCTURE GRADES 9-10 Standard CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.9-10.E Analyze the structure of the relationships among concepts in a text. etc.</p> <p>Standard CC.3.5.9-10.F Analyze the author's purpose in providing an explanation, describing a procedure...</p> <p>CRAFT & STRUCTURE GRADES 11-12 Standard CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.11-12.E. Analyze the structure of the relationships among concepts in a text.</p> <p>Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...</p>	<p>TEXT TYPES AND PURPOSE GRADES 9-10 Standard CC.3.6.9-10.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>TEXT TYPES AND PURPOSE GRADES 11-12 Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10 Standard CC.3.6.9-10.C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.9-10.E Use technology, including the Internet, to share writing products.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 11-12 Standard CC.3.6...11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.11-12.D. Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.11-12.E. Use technology, including the internet, to... share writing products.</p>	<p>ALGEBRA Standard. 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.</p> <p>Standard. 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.</p> <p>Standard. 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p>Standard. 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p>Standard CC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method.</p> <p>Standard CC.2.1.HS.F.3 Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs and data displays.</p>

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p>2124 Demonstrate knowledge of the fundamental principles of pneumatics.</p> <p>2125 Describe the characteristics of air compressors.</p> <p>2126 Explain systems used for the distribution and conditioning of air.</p> <p>2127 Measure and control air flow and air pressure.</p> <p>2128 Demonstrate knowledge of pneumatic actuators.</p> <p>2129 Operate and explain mechanical devices that operate on air pressure.</p> <p>2130 Construct, test, and troubleshoot a pneumatic circuit.</p> <p>2131 Apply knowledge of basic electricity in analyzing pneumatic circuits.</p> <p>2132 Explain where electronic switches and sensors may be found in pneumatic systems.</p> <p>2133 Demonstrate knowledge of electric control circuits and devices in pneumatic systems.</p>		<p>INTEGRATE KNOWLEDGE/ IDEAS GRADES 9-10 Standard CC.3.5.9-10.G. Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart). Standard CC.3.5.9-10.H. Assess the reasoning in a text to support the author's claim for solving a technical problem. Standard CC.3.5.9-10.I. Compare and contrast findings presented in a text to those from other sources, etc...</p> <p>INTEGRATE KNOWLEDGE/ IDEAS GRADES 11-12 Standard CC.3.5.11-12.G. Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem. Standard CC.3.5.11-12.H. Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible. Standard CC.3.5.11-12.I. Synthesize information from a range of sources into a coherent understanding.</p> <p>RANGE OF READING GRADES 9-10-11-12 Standard CC.3.5.9-10.J AND Standard CC.3.5.11-12.J. By the end of grades 9-10, AND 11-12, read and comprehend technical texts independently and proficiently.</p>	<p>RESEARCH GRADES 9-10 Standard CC.3.6.9-10.F. Conduct short and more sustained research. Standard CC.3.6.9-10.G. Gather relevant information. Standard CC.3.6.9-10.H. Draw evidence from informational texts.</p> <p>RESEARCH GRADES 11-12 Standard CC.3.6.11-12.F. Conduct short and more sustained research. Standard CC.3.6.11-12.G. Gather relevant information. Standard CC.3.6.11-12.H. Draw evidence from informational texts for research.</p> <p>RANGE OF WRITING GRADES 9-10-11-12 Standard CC.3.5.9-10.I and Standard CC.3.5.11-12.I. Write over extended and shorter time frames for a range of tasks, purposes and audiences...etc.</p>	

2200 Troubleshoot/Repair Fluid Power Systems and Their Components

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p>2201 Sketch flow path symbols and air logic schematics.</p> <p>2202 Interpret flow path symbols and air logic schematics.</p> <p>2203 Select and use properly sized pneumatic piping.</p> <p>2204 Maintain pressure regulators.</p> <p>2205 Install and adjust airlines.</p> <p>2206 Install and adjust pumps.</p> <p>2207 Install and adjust gauges.</p> <p>2208 Install and adjust cylinders.</p> <p>2209 Install and replace filters.</p> <p>2210 Install and adjust control valves.</p> <p>2211 Install, adjust and repair actuators.</p> <p>2212 Install and adjust pressure switches.</p> <p>2213 Install and adjust relays.</p> <p>2214 Adjust a pneumatic sensor temperature controller to a specified mixed air temperature.</p> <p>2215 Properly use dampers, thermostats, switches, pneumatic positioners, linkage assemblies and accessories in pneumatic systems.</p> <p>2216 Conduct routine preventive maintenance on pneumatic equipment in accordance with manufacturer's instructions.</p>	<p>CLUSTER: <i>Science, Technology, Engineering and Math</i></p> <p>Choose Cluster Standards from: 1-2-3-4-5-6</p> <p>2 PATHWAYS: <i>Engineering and Technology Careers</i></p> <p>Choose Standards from: 1-2-3-4-5-6</p>	<p>KEY IDEAS/DETAILS GRADES 9-10 Standard CC.3.5.9-10.A. Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.9-10B & Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.9-10.C Follow precisely a complex multistep procedure, etc...</p> <p>KEY IDEAS/DETAILS GRADES 11-12 Standard CC.3.5.11-12A Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.11-12.C. Follow precisely a complex multistep procedure, etc...</p> <p>CRAFT & STRUCTURE GRADES 9-10 Standard CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.9-10.E Analyze the structure of the relationships among concepts in a text. etc.</p> <p>Standard CC.3.5.9-10.F Analyze the author's purpose in providing an explanation, describing a procedure...</p> <p>CRAFT & STRUCTURE GRADES 11-12 Standard CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.11-12.E. Analyze the structure of the relationships among concepts in a text.</p> <p>Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...</p>	<p>TEXT TYPES AND PURPOSE GRADES 9-10 Standard CC.3.6.9-10.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>TEXT TYPES AND PURPOSE GRADES 11-12 Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10 Standard CC.3.6.9-10.C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.9-10.E Use technology, including the Internet, to share writing products.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 11-12 Standard CC.3.6...11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.11-12.D. Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.11-12.E. Use technology, including the internet, to... share writing products.</p>	<p>ALGEBRA Standard. 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.</p> <p>Standard. 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.</p> <p>Standard. 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p>Standard. 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p>Standard CC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method.</p> <p>Standard CC.2.1.HS.F.3 Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs and data displays.</p> <p>GEOMETRY Standard CC.2.3.HS.A.1 Use geometric figures and their properties to represent transformations in the plane.</p> <p>Standard CC.2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles.</p> <p>Standard CC.2.3.HS.A.12 Explain volume formulas and use them to solve problems.</p> <p>Standard CC.2.3.HS.A.13 Analyze relationships between two dimensional and three dimensional objects.</p> <p>Standard CC.2.3.HS.A.14</p>

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
		<p>INTEGRATE KNOWLEDGE/ IDEAS GRADES 9-10 Standard CC.3.5.9-10.G. Translate quantitative or technical information expressed in a text into visual form (e.g. a table or chart). Standard CC.3.5.9-10.H. Assess the reasoning in a text to support the author's claim for solving a technical problem. Standard CC.3.5.9-10.I. Compare and contrast findings presented in a text to those from other sources, etc...</p> <p>INTEGRATE KNOWLEDGE/ IDEAS GRADES 11-12 Standard CC.3.5.11-12.G. Integrate and evaluate multiple sources of information presented in diverse formats...to solve a problem. Standard CC.3.5.11-12.H. Evaluate the hypotheses, data, analysis, and conclusions in a technical text, verifying the data when possible. Standard CC.3.5.11-12.I. Synthesize information from a range of sources into a coherent understanding.</p> <p>RANGE OF READING GRADES 9-10-11-12 Standard CC.3.5.9-10.J AND Standard CC.3.5.11-12.J. By the end of grades 9-10, AND 11-12, read and comprehend technical texts independently and proficiently.</p>	<p>RESEARCH GRADES 9-10 Standard CC.3.6.9-10.F. Conduct short and more sustained research. Standard CC.3.6.9-10.G. Gather relevant information. Standard CC.3.6.9-10.H. Draw evidence from informational texts.</p> <p>RESEARCH GRADES 11-12 Standard CC.3.6.11-12.F. Conduct short and more sustained research. Standard CC.3.6.11-12.G. Gather relevant information. Standard CC.3.6.11-12.H. Draw evidence from informational texts for research.</p> <p>RANGE OF WRITING GRADES 9-10-11-12 Standard CC.3.5.9-10.I and Standard CC.3.5.11-12.I. Write over extended and shorter time frames for a range of tasks, purposes and audiences...etc.</p>	<p>Apply geometric concepts to model and solve real world problems.</p>

2300 Demonstrate Knowledge of Robotics

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p>2301 Demonstrate knowledge of safety rules and regulations for working around robots.</p> <p>2302 Use vocabulary words and terms specific to robotics.</p> <p>2303 Identify major systems of a robot.</p> <p>2304 Identify a robot's work envelope in a manufacturing cell.</p> <p>2305 Explain how robots are used in American manufacturing industries.</p> <p>2306 Describe the operation of a robot's drive system.</p> <p>2307 Describe the mobility of an industrial robot.</p> <p>2308 Demonstrate the procedure for programming a robot.</p> <p>2309 Describe industrial applications for robotics.</p>	<p>CLUSTER: <i>Science, Technology, Engineering and Math</i></p> <p>Choose Cluster Standards from: 1-2-3-4-5-6</p> <p>2 PATHWAYS: <i>Engineering and Technology Careers</i></p> <p>Choose Standards from: 1-2-3-4-5-6</p>	<p>KEY IDEAS/DETAILS GRADES 9-10 Standard CC.3.5.9-10.A. Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.9-10B & Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.9-10.C Follow precisely a complex multistep procedure, etc...</p> <p>KEY IDEAS/DETAILS GRADES 11-12 Standard CC.3.5.11-12A Cite specific textual evidence, etc....</p> <p>Standard CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; etc...</p> <p>Standard CC.3.5.11-12.C. Follow precisely a complex multistep procedure, etc...</p> <p>CRAFT & STRUCTURE GRADES 9-10 Standard CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.9-10.E Analyze the structure of the relationships among concepts in a text. etc.</p> <p>Standard CC.3.5.9-10.F Analyze the author's purpose in providing an explanation, describing a procedure...</p> <p>CRAFT & STRUCTURE GRADES 11-12 Standard CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain specific words...</p> <p>Standard CC.3.5.11-12.E. Analyze the structure of the relationships among concepts in a text.</p> <p>Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...</p>	<p>TEXT TYPES AND PURPOSE GRADES 9-10 Standard CC.3.6.9-10.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>TEXT TYPES AND PURPOSE GRADES 11-12 Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10 Standard CC.3.6.9-10.C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.9-10.E Use technology, including the Internet, to share writing products.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 11-12 Standard CC.3.6...11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience.</p> <p>Standard CC.3.6.9-10 D Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.11-12.D. Develop and strengthen writing as needed.</p> <p>Standard CC.3.6.11-12.E. Use technology, including the internet, to... share writing products.</p>	<p>ALGEBRA Standard. 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.</p> <p>Standard. 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems.</p> <p>Standard. 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> <p>Standard. 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.</p> <p>Standard CC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method.</p> <p>Standard CC.2.1.HS.F.3 Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs and data displays.</p>

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2400 Demonstrate Knowledge of Work Cells in a Manufacturing System

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
<p>2401 Demonstrate knowledge of the fundamental operating principles used in flexible manufacturing systems.</p> <p>2402 Assemble and test a fluid power work cell using PLC sensors.</p>	<p>CLUSTER: <i>Science, Technology, Engineering and Math</i></p> <p>Choose Cluster Standards from: 1-2-3-4-5-6</p> <p>2 PATHWAYS: <i>Engineering and Technology Careers</i></p> <p>Choose Standards from: 1-2-3-4-5-6</p>	<p>KEY IDEAS/DETAILS GRADES 9-10 Standard CC.3.5.9-10.A. Cite specific textual evidence, etc.... Standard CC.3.5.9-10B & Determine the central ideas or conclusions of a text; etc... Standard CC.3.5.9-10.C Follow precisely a complex multistep procedure, etc...</p> <p>KEY IDEAS/DETAILS GRADES 11-12 Standard CC.3.5.11-12A Cite specific textual evidence, etc.... Standard CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; etc... Standard CC.3.5.11-12.C. Follow precisely a complex multistep procedure, etc...</p> <p>CRAFT & STRUCTURE GRADES 9-10 Standard CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain specific words... Standard CC.3.5.9-10.E Analyze the structure of the relationships among concepts in a text. etc. Standard CC.3.5.9-10.F Analyze the author's purpose in providing an explanation, describing a procedure...</p> <p>CRAFT & STRUCTURE GRADES 11-12 Standard CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain specific words... Standard CC.3.5.11-12.E. Analyze the structure of the relationships among concepts in a text. Standard CC.3.5.11-12.F Analyze the author's purpose in providing an explanation, describing a procedure...</p>	<p>TEXT TYPES AND PURPOSE GRADES 9-10 Standard CC.3.6.9-10.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>TEXT TYPES AND PURPOSE GRADES 11-12 Standard CC.3.6.11-12.B Write informative or explanatory texts, including the narration of technical processes, etc.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 9-10 Standard CC.3.6.9-10.C Produce clear and coherent writing...appropriate to task, purpose, and audience. Standard CC.3.6.9-10 D Develop and strengthen writing as needed. Standard CC.3.6.9-10.E Use technology, including the Internet, to share writing products.</p> <p>PRODUCTION & DISTRIBUTION OF WRITING GRADES 11-12 Standard CC.3.6...11-12 C Produce clear and coherent writing...appropriate to task, purpose, and audience. Standard CC.3.6.9-10 D Develop and strengthen writing as needed. Standard CC.3.6.11-12.D. Develop and strengthen writing as needed. Standard CC.3.6.11-12.E. Use technology, including the internet, to... share writing products.</p>	<p>ALGEBRA Standard. 2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems. Standard. 2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multistep problems. Standard. 2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. Standard. 2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers. Standard CC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method. Standard CC.2.1.HS.F.3 Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs and data displays.</p> <p>GEOMETRY Standard CC.2.3.HS.A.1 Use geometric figures and their properties to represent transformations in the plane. Standard CC.2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles. Standard CC.2.3.HS.A.12 Explain volume formulas and use them to solve problems. Standard CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects. Standard CC.2.3.HS.A.14</p>

Secondary Competency Task Grid with Unit and Task Numbers	Common Career Technical Core Standards	Pennsylvania Core Standards for Reading for Technical Subjects Standard 3.5	Pennsylvania Core Standards for Writing for Technical Subjects Standard 3.6	Pennsylvania Core Standards for Mathematics Standard 2.1
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